

WHAT IS CLAIMED IS:

1. An optical component comprising:

an optical main path in which light is guided from a light input end to a light output end;

5        a first optical coupler and a second optical coupler respectively provided on said optical main path;

10        a first optical side path provided between said first and second optical couplers and adjacent to a part of said optical main path, wherein a first Mach-Zehnder interferometer is comprised of said first optical side path and said first and second optical couplers;

15        a third optical coupler and a fourth optical coupler respectively provided on said optical main path;

20        a second optical side path provided between said third and fourth optical couplers and adjacent to a part of said optical main path, wherein a second Mach-Zehnder interferometer is comprised of said second optical side path and said third and fourth optical couplers;

25        a third optical side path provided between said second and third optical couplers and adjacent to said optical main path;

a first temperature controller for controlling a

temperature of at least one of a part of said optical main path located between said first and second optical couplers, and said first optical side path;

5 a second temperature controller for controlling a temperature of at least one of a part of said main path located between said third and fourth optical couplers, and said second optical side path; and

10 a first filter circuit provided on at least one of a part of said optical main path located between said second and third optical couplers, and said third optical side path, said filter circuit having a wavelength-dependent insertion loss.

2. An optical component according to claim 1, further comprising:

15 a controller for controlling temperatures of said optical paths by use of said first and second temperature controllers on the basis of the insertion loss of said first filter circuit, in order to set a loss for light with a predetermined wavelength propagating between said light input end and said light output end, to a desired value.

3. An optical component according to claim 1, wherein said first filter circuit comprises:

25 a fifth optical coupler, a sixth optical coupler, and a seventh optical coupler respectively provided on one of a part of said optical main path located between

said second and third optical couplers, and said third optical side path;

5 a fourth optical side path provided between said fifth and sixth optical couplers and adjacent to a part of one of said optical main path and said third optical side path, wherein a third Mach-Zehnder interferometer is comprised of said fourth optical side path and said fifth and sixth optical couplers; and

10 a fifth optical side path provided between said sixth and seventh optical couplers and adjacent to a part of one of said optical main path and said third optical side path, wherein a fourth Mach-Zehnder interferometer is comprised of said fifth optical side path and said sixth and seventh optical couplers;

15 wherein an optical path length of said fourth optical side path is different from an optical path length of a part of one of said optical main path and said third optical side path located between said fifth and sixth optical couplers, and

20 wherein an optical path length of said fifth optical side path is different from an optical path length of one of said optical main path and said third optical side path located between said sixth and seventh optical couplers.

25 4. An optical component according to claim 1, wherein said first filter circuit comprises a grating

formed in one of a part of said optical main path and said third optical side path located between said second and third optical couplers.

5        5. An optical component according to claim 1, further comprising:

10            a second filter circuit, in addition to said first filter circuit provided on at least one of a part of said optical main path and said third optical side path located between said second and third optical couplers, wherein said second filter circuit is provided on the other of the part of said optical main path and said third optical side path located between said second and third optical couplers,

15            wherein an insertion loss spectrum of said first filter circuit is different from that of said second filter circuit.

20        6. An optical component according to claim 5, wherein each of said first and second filter circuits includes a grating.

20        7. An optical amplification module including an optical component according to claim 1.

25        8. An optical amplification module according to claim 7, further comprising a variable loss slope compensator.

25        9. An optical transmission system including an optical component according to claim 1.

10. An optical transmission system according to claim 9, further comprising a variable loss slope compensator.